CARNEGIE MAGAZINE

CARNEGIE INSTITUTE | CARNEGIE INSTITUTE OF TECHNOLOGY | CARNEGIE LIBRARY

VOLUME VIII PITTSBURGH, PA., JUNE 1934 NUMBER 3

JAPANESE IVORY CARVING
IN THE H. J. HEINZ COLLECTION
CARNEGIE INSTITUTE

THE CARNEGIE MAGAZINE

PUBLISHED MONTHLY, EXCEPTING JULY AND AUGUST, IN THE INTEREST OF THE CARNEGIE INSTITUTE, THE CARNEGIE INSTITUTE OF TECHNOLOGY, AND THE CARNEGIE LIBRARY, PITTSBURGH, PA. SUBSCRIPTION PRICE ONE DOLLAR A YEAR; SINGLE COPIES TEN CENTS. ON SALE AT INSTITUTE POST OFFICE, AND PRISCILLA GUTHRIE'S BOOK SHOP.

OFFICE OF THE PRESIDENT OF
THE CARNEGIE INSTITUTE

SAMUEL HARDEN CHURCH, Editor
EMILY R. ALTER, Editorial Assistant

EDITORIAL COUNCIL

THOMAS S. BAKER — ANDREY AVINOFF
HOMER SAINT-GAUDENS — RALPH MUNN
MARSHALL BIDWELL

VOLUME VIII — NUMBER 2
MAY 1934

By Jove, I am not covetous for gold;
Nor care I who doth feed upon my cost;
It yearns me not if men my garments wear;
Such outward things dwell not in my desires:
But if it be a sin to covet honor,
I am the most offending man alive.

—KING HENRY V

HOURS OF ADMISSION—ALWAYS FREE

Daily from 10 A.M. to 10 P.M.
Sunday from 2 to 6 P.M.

FREE ORGAN RECITALS

From October to July. Every Saturday evening at 8:15 oclock, and every Sunday afternoon at 4:00 oclock.

MARSHALL BIDWELL, Organist

The Carnegie Institute, in the broadest sense, holds its possessions in trust for mankind and for the constant welfare and happiness of the race. Anyone, therefore, who by a gift of beautiful works of art, or objects of scientific value, or a donation to its financial resources, aids in the growth of these collections and the extension of its service is contributing substantially to the glorious mission of the Institute.

The Carnegie Institute will be the final home of every worthy collection of pictures and museum objects when the men and women who have chosen them wish to have the world enjoy them.

—ANDREW CARNEGIE

BON JOUR, ADMIRAL REEVES!

Joseph Mason Reeves has just been commissioned to command the American fleet. Admiral Reeves was educated at Annapolis, and was a star player in football there; was on the battleship Oregon in her memorable voyage around Cape Horn in time for the battle of Santiago; taught physics and chemistry at the Naval Academy; always helped the slow students over the rough places in their studies; won the Naval Cross in the World War; has made himself the chief authority in naval aeronautics, and is the first air man to command the fleet; teaches that in war the best defense is the offense; is very human, always considerate, terribly in earnest. His appointment as his country's first officer afloat will sustain the confidence which the nation has always cherished in its Navy.

THE RECALL OF OUR GARDENERS

DEAR CARNEGIE:

What is the meaning of the statement in your May number that "Jason and Penelope, who have been tending the Garden of Gold through these many years, have gone away on a well-deserved and indefinite vacation"? How can your Garden continue to bring forth its "Golden Fruitage" in such constant abundance without the nourishing care of a Gardener?

—JONAS R. HALCOMB

Jason and Penelope are back in the Garden of Gold in this month of roses.

THE ADULT SKETCHING CLASS

DEAR CARNEGIE:

The art classes in the Lecture Hall attracted the attention of Mrs. Lencher and myself during the last few weeks, and I felt it proper to write you a note of appreciation.

The other evening there were easily over one hundred people—young and old, male and female—listening in rapt attention to the lecturer and and then proceeding out into Schenley Park to do some sketching.

It struck me as a magnificent part of the program carried on by the Institute for the community, and I take the liberty of encouraging its continuation and commending the staff for a splendid piece of adult education. That surely is one fine way of licking this business of "time on your hands" which confronts so many of our people.

—BENJAMIN LENCHER

Judge Lencher refers to a weekly sketching class for adults inaugurated this spring at the Carnegie Institute. The class has been free to anyone who wished to join, and the enrollment—with an average attendance for nine indoor meetings of 333 and of 151 for three held in the Park—has exceeded all expectation. The success has been so marked and the interest so sincere that its future is assured. When the class reassembles in the autumn, the Magazine will carry an announcement and an account of its activity.

TONGUES IN TREES

To be able to find recreation within oneself, to know how to occupy one's leisure constructively and without recourse to artificial entertainment—these are priceless capacities.

The recent scourge of unemployment has revealed to us the mental unrest that follows in the wake of enforced free time when there is no background for its enjoyment. Leisure, which is the delight of the person who utilizes it in its fullness, has proved only a visitation—a period of monotony and stagnation—to those who have not been equipped to spend it fruitfully.

In the forward-looking programs of our great public schools, always the first to catch the new vision and to anticipate correctives, this preparation for productive and satisfying leisure is growing each year in importance. Long ago our schools seized upon the benefits to be derived from organized sport. Today we have constant opportunity to observe those valuable lessons in coordination, alertness, stamina, and forebearance applied in adult life that were first learned in playing the fair game in school. In more recent years the study of Nature has commended itself as a new provision for the use of leisure. As a study which can be carried with affluent gain beyond the schoolroom walls and into later life it has boundless possibilities. In the enrichment of free time by giving students a sustained interest in the phenomena of science and a habitual curiosity concerning the manifestations of Nature it is probably providing one of the few effective answers to a vexing social problem.

The reverence for the orderliness of Nature, its laws and mysterious forces, its bounteousness and frugality, its beauty and its balance—these are but a few of the points of emphasis which form the foundation for an abiding love of the outdoors, to which all can have access without cost throughout life.

To further the influence of this study in and out of the schoolroom, the Carnegie Institute last month cooperated in a unique contest open to the school children of Western Pennsylvania, which was originated by the Associated Science Groups, a group of science teachers of this district of the State.

The object of the contest, which was held at the Museum on May 19, was the identification of specimens chosen from the various forms found in our natural environment. The more advanced students had to recognize a hundred, and the younger children fifty.

This is the first time that such a contest has been held here. Its success has been watched with an eye to imitation by progressive educational groups. So gratified were the local schools and the Museum staff with the results that it has been decided to hold it annually.

WATER COLORS BY ELIOT O'HARA

THERE is a theory in esthetics that a given subject demands a definite medium for its perfect expression. One subject may be best defined in music, another in poetry, another in sculpture, and still another finds its truest interpretation in oil painting.

Undoubtedly Eliot O'Hara, whose exhibition of water colors is now being shown at the Carnegie Institute, takes the position that landscape demands water color for its highest medium of translation. His exhibition bears out this interesting thesis; for water color lends itself to all the demands of landscape, which requires large massing of color, freedom from minute details, an impression of ease of drawing, and above all, a sense of spontaneity. It is the medium which Mr. O'Hara has found to be best suited to his need and he uses it exclusively as his artistic method.

Mr. O'Hara migrated from business into the world of art only seven or eight years ago. Until that time he was the manager of a factory in Waltham, Massachusetts, his native city. He first became interested in water colors through his friend and instructor, Russell T. Hyde, now associate professor of Painting and Decoration at the College of Fine Arts, Carnegie Institute of Technology. Later he studied for a time with Charles Hopkinson. During the summer of 1925 he spent four or five months in Europe and northern Africa on a vacation. He made water colors of the scenes he enjoyed and on his return he was persuaded by friends to send some of these pictures to the Annual Water Color Exhibition at the Pennsylvania Academy of the Fine Arts. On their acceptance Mr. O'Hara decided he must paint rather than oversee

MOUNT VERNON

manufacturing processes. In 1928 he was awarded a Guggenheim Fellowship and for the next two and a half years he painted in various countries of Europe. In the winter of 1932-33 he spent five months on a painting tour in South America.

AVILA IN THE RAIN

The exhibition at the Institute, which consists of forty-eight pictures, might very well be termed "Around the World in Water Color with Eliot O'Hara." Maine, where he paints and teaches in the summer, figures in a large number of his pictures. These are done in a simple, broad fashion with cool colors, as in "Goose Rocks Beach" and "Wet Sand." When the artist transfers his attention to Spain and France, his pictures take on a richness in design and a warmth in color that one associates with those lands. For instance, "The Bridge at Ronda" expresses great strength in its design and the joyous sunshine of Spain in its color. And then the artist moves on to Newfoundland, as in "The Kyle at Pack's Harbor" with its coldness and the striking contrast between the tiny steamer and the overpowering mountains in the background. South America has a fascination for Eliot O'Hara as indicated in "A Lake in the Andes" with its greenish and bluish mountains and the foreboding clouds high over white water; or again in "Santos, the Coffee Port" with its church, massive in design, and the whole enveloped in warm color. On occasion Mr. O'Hara paints with charm and delicacy and sensitiveness when he turns to such subjects as "The Tarkingtons' Garden" or "Cherry Blossoms," and again he takes on strength and assurance when his topic is "Frozen Assets"—a blocked, cold study of Wall Street—or from "Battery Park," in which ominous skyscrapers mount up from the little contrasting green spot at the Battery.

Just as Mr. O'Hara travels far into unusual and remote places for his subjects, he is never satisfied to see them in the ordinary or commonplace way. That makes his exhibition a very attractive one. He pictures Mont Saint Michel, not direct as it has been seen for centuries in paintings and water colors, but as it casts a shadow, and he sees the statue of John of Segovia oddly enough, but picturesquely, from the rear. In "Mount Vernon" he pictures the famous home not from the front, but from an unexpected side view. He succeeds in seeing ordinary subjects in an extraordinary way.

The artist has an exceptional command of his medium. He makes water color carry out his intent without disclosing or making obvious his technical skill. He confines himself to a minimum of subjects which he knows intimately and feels keenly. He knows well what to eliminate, which is a great virtue in an artist. In a sentence, he has found his medium of artistic expression in water color and he clings to it with a mastery and a fascination which is subtly carried over to the beholder.

The exhibition, which is hung in the balcony of Sculpture Hall, opened on June 14 and will continue through July 15.

SEEKING SEA PLANTS IN GLACIER NATIONAL PARK

By Carroll Lane Fenton

[Because of his great respect for the internationally outstanding research carried on by the Carnegie Museum, Dr. Fenton, a geologist and paleontologist of high scientific distinction, has chosen this institution to be the permanent repository for many of his important finds in Canada and the United States. He is an authority on the Devonian of Iowa and the geological strata of the Rockies, where he returns next month to pursue his search for fossils ranging in age from thirty million to three hundred million years, to study variation in plants, and to gather data on their surroundings. Fossils and rocks obtained on this newest expedition will be sent to enrich the Museum's vast collections.]

"So you're geologists!" someone exclaimed as we spread diagrams and maps. "What a country this must be for you, if you don't let science step in to spoil the beauty of glaciers and mountains."

For a day we had traveled across the plains, where cattle grazed in red-brown herds and sheep raised moving clouds of dust. Then in the West the Rockies appeared—a line of blue, snow-tipped peaks rising without the mask of foothills. At last we climbed a crumpled ridge beside a quiet lake and stopped at the foot of Rising Wolf Mountain. We were back in Glacier National Park, ready to resume our search for the oldest fossils in North America.

THE AUTHOR SECURING ANCIENT PLANTS ON A GLACIAL WALL

As we folded our maps at the dinner call, our critic resumed attack. "The trouble with you rock hunters," he said, "is that you think of ages and names but ignore scenic beauty. Forget fossils, formations, and faults and try to enjoy the mountains!"

We thought of this when we met him next day among the twisted pines on Mount Henry. What he saw was a "million-dollar view"; for us that view held added depth as the record of six hundred million years through which the West has grown and changed.

When those long ages began, the present mountains were the floor of a sea stretching from the Atlantic Ocean southward to what is now Wyoming. Perhaps it joined another bay advancing from Arizona.

Into that sea rivers flowed bringing loads of dissolved materials as well as silt, gravel, and sand. Coarse grains sank to the bottom near shore; fine ones went farther out to sea before they settled in beds of mud, or mucky dolomite and lime. For millions of years they gathered and hardened until they formed a series of rocks fifty to sixty thousand feet thick.

Then sinking gave way to upheaval, and part of these strata were worn away. But new seas advanced from the north, leaving rocks like those about Banff or the older ones above Lake Louise. Again the marine basin arose, until beds which had formed beneath the sea were pushed upward into land. Upon it roamed dinosaurs—tall reptiles with ducklike beaks, short ones plated with armor, and carnivores with savage

teeth. They fed and hunted in swampy glades that now are the plains of Glacier County; they fled before a chalk-age sea whose rocks now rim deep coulees, or troughs. Soon that sea itself was thrust back by a mighty earth shove from westward. Before it strong rocks lifted and crumpled; when they could bend no more they broke and slid eastward across those before them. When they finally stopped, they had traveled thirty miles and stood in high mountain ranges upon the younger beds of the plains.

LOOKING OUT UPON UPLIFTED SEA FLOORS NEAR THE ENTRANCE TO GLACIER PARK IN THE ROCKIES

We traced the records of uplift as we climbed above the twisted pines. We had to contend not only with the mountains themselves, rising abruptly from gentle slopes, but with rocks tipped, bent, and broken by the force that raised them from depths. Across the valley was a wedge of limestone driven into a formation of shale that should rightfully stand two thousand feet above it. At the foot of the cliffs lay the great fault itself: the line along which the whole mountain mass moved early in the Age of Mammals.

We also saw why early explorers called the northern Rockies "shining mountains." The rocks near the fault were yellow-buff, weathered limestones and marbles. Above them rose slopes of satiny green, dipping toward a blue glacial lake. On the green stood cliffs of Indian red, whose tips are stained golden by lichens. At the top were pinnacles of ocher, crossed by bands of white and gray.

Each new color marks a formation, tells a tale of geologic change. The buff beds tell of a quiet sea floor covered with hardening banks of lime. The green ones record times of shallower water when broad flats were laid bare to the sun. Often their muds dried and cracked—and because the cracked edges turned down we know that the vanished waters were salty. Fresh water muds lie flat or turn upward, as they do in every drying pond.

We found cracked beds beside the trail and took one slab for the Carnegie Museum. We also discovered a greenish slope where the rock was covered with pits, caused by rain drops striking before the muds grew hard, the drops digging shallow holes preserved and buried when waters returned. A rainstorm six hundred million years old, with even the direction of the wind recorded!

The red beds betray even greater shallowing—perhaps times when even the sea gave way to broad valleys swept by river floods. One day we set out for a wall of rock whose tip stood forth like a single pillar. At its foot a tiny glacier lay, in whose tumbled moraine we found red slabs bearing ripples made by waves or by currents that swept along a shore. We also found queer chips and balls, bits of partly hardened bottom broken and tossed by storms. They are now in the collection in the Carnegie Museum

which tells of Montana's past. But what of our search for fossils?

For animals, success was slight. On a trail high above the glacier, we one day found two slabs of brown stone. Across them lay wriggly ridges—the filled burrows of worms that bored beneath an ancient beach. But in finding one type we lost another, for small fossils once thought to be crustaceans proved to be broken fronds of plants!

These plants waved above lime-mud bottoms that now form the buff cliffs just above the great break or fault. Seeking them we found columnar objects of stone made up of convex layers like saucers piled bottom-side-up. In some cliffs they were scattered, irregular; in others we found them closely packed. Near the scenic center called Many Glaciers we found thick ledges built of little but these layered columns.

The late Charles Walcott had described three fossil plants from younger limestones in Glacier Park. But his work had prepared us for nothing like this: beds built of little else than limy masses of colonial algae [seaweeds]! We found them in cliffs and beneath falls; in countless blocks that had slumped down over the soft shales below. When the time came for formal description, we called them Collenia columnaris because of their columnar form.

One of the Park's most traveled trails leads from the Many Glacier camp and hotel across Swiftcurrent Pass. Taking it one August day, we crossed the great wall of limestone that rises into spectacular peaks. Near its top we found heavy gray ledges—and they too were packed solid with plants.

Five years were to pass before we understood the full meaning of those fossils, whose shapes ranged from cones to crumpled plates. In the meantime a highway was built across beautiful Logan Pass. For miles it was blasted from the mountain side, and that blasting uncovered two reefs built by those ancient, simple plants. In them we found our four puzzling forms so close—and so closely intergrading—that we at last felt sure they were but one species. Variations like those of modern algae in these reefs of Proterozoic age!

Much geologic work in the Park can be done from motor camps and hotels on trails taken by every tourist. For longer trips there are chalets and horse camps, open alike to hikers and riders. Only in the western peaks need one bother with his own pack outfit.

Friends of camp and trail often join our fossil hunts. On our second visit to the reefs, a whole Nature caravan followed our rock-laden roadster. A party from Cleveland crossed Swiftcurrent Pass with us; two boys, aged twelve and fourteen, helped carry our specimens down nine steep miles of trail. An artist and three college students were with us when we found one rarely fine plant on the ice of Grinnell Glacier.

That plant had fallen from the high cliff forming the continental divide. Once it had grown in a shallow bay, whose floor still showed pits and cracks formed when the water had drained away. Waves sometimes swept in from depths, tumbling the algae about on the hardened greenish mud. At other times lavas burst forth, turning the shallow bay into steam as they rolled along in streamers and lumps. The algae were burned to hard red balls that lie beneath the cooled lavas.

We found many of these fossils at Granite Park, near the southern edge of the ancient flows. And just to show what's in a name: the "park" is a slope set with tall firs, where bear grass and glacier lilies bloom in early July; the "granite" is either the greenish lava or a gray rock called diorite, a mile or more southward on one of the trails; and the "bear grass" is a lily in which bears show no interest!

The plants of valleys and alpine meadows turn us into amateur botanists as we seek ancient algae and sediments. As for scenic beauty, no amount of science can seriously diminish it.

What if Iceberg Lake is a tarn, dug by an almost vanished glacier in limestones of Siyeh [pre-Cambrian] age? It is also a magnificent scene; and the fact that its towering walls once were sea muds only gives them meaning as well as beauty.

One day we took a boat down Waterton Lake, which joins Montana and Alberta. Sun gilded the towers on Porcupine Ridge, a wall between two of the glaciers that sculptured these mountains during the ice age. With us were two Texas friends who had hiked through much of the park, and now were ready to join one of our fossil-hunting trips.

We left on a bright August morning, putting our food and some of our duffel on a pack horse engaged for the day. It would carry our extras fourteen miles; then we could make camp or move on, returning when supplies were exhausted.

We climbed till we reached an open pass, then skirted a valley in which ice once was two thousand feet thick. We pitched camp in a bowl where a glacier once rose; a place geologists call a cirque, but the prospector knows as a "half-kettle valley." If you know the prospector's black iron pot, you will enjoy the aptness of his name.

Fossils were almost everywhere. Below us stood thick ledges like those near Swiftcurrent Pass. Above them were less compact beds holding massive colonies two to three feet across. We must find something smaller than they —and pushing through a clump of firs we came upon two fossils ten feet wide and five feet thick! We could not collect them, but we made a photograph that would prove the monsters real.

That night, about the camp fire, we discussed the day's finds—for our friends, a number of rare flowers and a point that gave them views of glaciers, lakes, and distant peaks; for ourselves, a stratigraphic section and fossils much too large to take away; for both, treasures of knowledge and beauty to enjoy long after we should lower our temporary canvas homes.

ONE HUNDRED FRIENDS OF PITTSBURGH ART

SEVENTEEN years ago John L. Porter first instituted the One Hundred Friends of Pittsburgh Art. His far-seeing object was twofold: to encourage our local artists by purchasing their works, and to adorn the walls of our public schools by making them the recipients of the purchases.

Mr. Porter asked ninety-nine others to support the cause by giving $10 a year toward a fund to be spent for pictures selected from the annual exhibition of the Associated Artists of Pittsburgh. The result is that our schools now own an ever growing collection in which can be found some of the city's finest talent. Of the 103 paintings in the collection, eleven were selected from the most recent exhibition. The list of the new pictures follows: "Narcissus" by David Beggs, "Chinese Vase" by Sister M. Clare Besterman, "Still Life" by Elizabeth M. Herron, "New Dress" by Roy Hilton, "Mount Rockwell, Glacier Park" by J. C. Kilroy, "Hungarian Czardas" by Milan Petrovits, "Passerby" by Robert F. Reamy, "Circus Rhapsody" by Harry Scheuch, "South Side Church" by Robert Schmertz, "Cleve" by Raymond Simboli, and "River in Winter" by Vernon Wilson.

EDUCATION OF PUBLIC OPINION

Promote, then, as an object of primary importance, institutions for the general diffusion of knowledge. In proportion as the structure of a government gives force to public opinion, it is essential that public opinion should be enlightened.

—GEORGE WASHINGTON

If future generations are to have that high regard for the achievements of the human mind which is essential to civilization, there must be a true reverence for learning in the community. It is not sufficient to train investigators and scholars, no matter how brilliant they may be; a large body of influential citizens must have a passionate interest in the growth of human knowledge.

—JAMES BRYANT CONANT

THE COORDINATION OF THE PHYSICAL AND SOCIAL SCIENCES

By Waldemar Kaempffert
Science Editor of the New York Times

[This stirring address, which kept the lamp of wisdom shedding its rays of hope and courage through the darkened problems of the present day, was delivered at the twenty-seventh commencement of the Carnegie Institute of Technology on June 11. With Dr. Baker presiding, Syria Mosque was filled to its capacity. Mr. Kaempffert's distinguished position on the Times requires him to be on familiar terms with everything affecting the development of pure and objective science, and this discourse from a mind so richly stored will challenge the imagination of the Carnegie Magazine's readership.]

Commencement orators, ever since there were commencement exercises, have impressed upon the graduates whom they addressed the solemnity of their passage from college to the larger life of the outer world. This is as it should be. Yet I doubt if there has been a more solemn graduation from the Carnegie Institute of Technology than this. It is certainly more momentous than was my graduation in 1897. You pass from academic life buoyed not only with your own high hopes and will to succeed but burdened by our reliance upon you. I can assure you that your graduation means as much to us, your elders, as it does to you. For you are graduating not simply into the life of the world in which we grew up but into a new era. It is your task not only to carve out independent careers for yourselves but to mold this new era. Some of us elders are still young enough to be affected by the work that you will do. And it is for this reason that your departure is of vital concern to us.

It is my purpose this morning to contrast the period in which I matured with that which you will shape, to indulge in a few harmless predictions, and to suggest a closer union of engineering and the social sciences, to the end that mankind may guard itself against a recurrence of disaster which has overtaken it time and time again. At the outset I wish to assure you that I realize how hazardous it is to remold the world without so vast a knowledge of human affairs and capabilities that no one man can possibly possess it.

Just to emphasize the risks that I run let me read to you a letter which was written a little more than a hundred years ago by a French physician, Dr. Alex Guemot. A son had been born to him. The year was 1832. Europe was in a state of political doubt and economic confusion—both the result of the Napoleonic wars. In fact there was a certain similarity between the situation then and now. What would be the fate of this new-born son? Dr. Guemot was worried. So he wrote to an intimate friend the day after his boy was born:

"I do not know whether to be happy or sorry over the birth of a son. . . . The poor infant enters the world in very troubled times. Hardly seventeen years have passed since peace was restored to Europe, and we still suffer cruelly from the effects of the war. Who knows if my son will not one day be forced to become a citizen of a republic? It makes one shudder. The conditions of life are daily becoming more difficult. Nanette, our servant, has paid twenty-three sous for half a

kilo of butter and two sous for each fresh egg. It is absurd and exorbitant.

"I would like to see my son embracing the noble career of medicine, but I see quite well that he cannot. One of the heads of the faculty has confided to me that this profession is literally invaded, and then this madness of speed is wearing out men. Only yesterday I saw a post chaise tearing along. It makes one giddy. The horses were galloping at more than five leagues an hour, and everyone wants his carriage. The streets of Paris are so congested that you must wait a long time if you wish to cross them. Madness of the century, my dear friend, for which men will pay in the brevity of their days! My son, like his contemporaries, will not live to be old. We know not what the future has in store for him, but we can wager with certainty on his not becoming a centenarian."

Nearly every one of these forebodings was belied by subsequent events. Contrary to his father's expectations the son became the famous physician Dr. Alex Guemot. He also became the citizen of a republic, and he rode in railway trains, automobiles, and for all I know, in airplanes at a speed so mad that it would have appalled his parent. To cap the climax, this child, which was certain not to become a centenarian, was honored by the French Academy of Medicine on his one hundredth birthday in 1932.

In evaluating the future—I hope less gloomily than did Dr. Guemot—I turn to my graduation in 1897 and compare it with yours. As I look back at it now it was a comfortable world that we faced. Some graybeards, distinguished generals of the Civil War, gave us much sound advice. The world was a battleground, we were told. But there was a sure formula for victory. If we were industrious, thrifty, and intelligent we were bound to establish ourselves. And if we were very industrious, very thrifty, and very intelligent we might even count on fame and wealth.

I must confess that at times the struggle was not easy. There were certain similarities between the year 1897, my year, and 1934. We were slowly recovering from the panic of 1893, which was in turn one of the consequences of the Civil War. We had strikes and enforced idleness. There were moments when the financial outlook was even blacker than it was a year ago. The economic and social machinery creaked for some years. In the end it was repaired. Indeed it functioned, if anything, with even greater efficiency than before. Certainly the depressions and panics through which we passed were as nothing compared with the situation in which we are now immersed. But it was a lack of things with which we had to cope—lack of food, lack of money, lack of goods. Today we face years of plenty, yet they are years of misery. We suffer, strangely enough, because we have too much wheat and cotton, because we produce too abundantly nearly everything that human beings need. This condition is world-wide, and therein it differs from that of my youth. Because it is world-wide it seems to many of us that it cannot be overcome by any one country alone and that it calls not for a new political system but for new social and economic conceptions and practices.

I belong to the gas-light and the horse-buggy period. I recall that the man who first drove an automobile through Central Park in New York was arrested for disorderly conduct. The telephone was only twenty years old when I graduated, and it had been in commercial use for not much more than fifteen. A gifted Italian lad hardly out of his teens—his name was Marconi—had attracted some mild attention by sending telegraphic signals without wires for a distance of a mile or two, and the more knowing of my elders began to talk of wireless telegraphy and to express their misgivings about the futility of his experiments. A bearded German professor, named Röntgen, had discovered some mys-

terious, so-called X rays which made it possible to photograph bones in the living flesh. I remember that the Pall Mall Gazette of London was horrified. It referred to the discovery as one of "revolting indecency" and hoped that something could be done to thwart those who might attempt to apply it.

There were no airplanes in those calm and peaceful days of my graduation. I remember that I paid ten cents once to put some rubber tubes into my ears so that I might listen to Edison's phonograph. What I heard purported to be the ravings of mad John McCullough, a famous actor. The first crude motion pictures had appeared. You can imagine how innocent we were when I tell you that we paid money to see on the screen the Empire State express crawling over the landscape, or the waves beating on the beach of Atlantic City, or William McKinley, then running for President, gesticulating before a crowd. We marveled. What next? we asked ourselves.

There was no radium. The North Pole and the South Pole were places on the map to which no one had ever been. Only the fastest steamers crossed the Atlantic in seven days.

In a single generation this picture changed to what you behold now. Technological advance is nothing new. It began with the primitive man who first built a fire a million years ago. But in the last generation that advance has proceeded at an accelerated pace. When I think of the airplane, the automobile, radio broadcasting, the development of the electron theory of matter, and similar innovations I am convinced that so far as scientific discoveries and engineering achievements are concerned we have progressed relatively farther in that generation than in the whole preceding century. And the reason for this astounding onward sweep is a method of thinking and doing which we associate with the physical sciences. It is a method which collects its facts with a fine, impersonal, almost religious devotion to the truth and which tries to exclude the emotional. It is the essential objectivity and honesty of that method that I wish to emphasize. That method, which we inherited and elaborated, we pass on to you. It is our finest bequest. It is the key, many think, to the social salvation of mankind.

But when we look back at this record, brilliant as it is, we see how reckless men have been ever since they knew about the method. The ultimate purpose of the engineer is to change the environment of mankind. Let us not forget that the oldest human bones are not more than a million years old. What has happened in those million years it is not my purpose to recite here. The point is that in those million years the environment has been changed through science and engineering. This hall, these electric lights, these clothes, the trolley cars outside, the great bridges, the steel mills—all these are strikingly artificial. And the environment is becoming so artificial that we are already making our own indoor climates and carrying them with us in our trains. Manual labor is certainly lighter than it ever was. There is even a prospect that it will disappear in its grosser aspects.

Purpose is supposed to direct human destiny. To what purpose did we humans change our environment, so that we no longer hunt in the jungle but meet one another in skyscrapers of stone and steel or talk over telephones half around the earth? We cannot answer. Our rise from caveman to engineer was blind; it was planless. We allowed this structure that we call civilization to grow without knowing what we wanted to achieve. And now the thing that we created, this artificial environment, threatens to crush us. By this I mean, of course, that we reckoned not with the social consequences of our own ingenuity and scientific penetration. The irrational utilization of the machine in industry and in war have brought us to our present pass. Ten million men are idle in this country alone because we gave no heed

to the effects of the machine. We saw only more bathtubs, more automobiles, more aircraft, more vacuum cleaners, a more highly mechanized society. Also we coined some fine phrases about this mechanization and talked of relieving labor of drudgery and of creating more leisure. But whither we were drifting spiritually, economically, socially we saw not.

We had a grand way of appraising the social effects of our success in improving communication. Whenever a new international telegraph or cable system was opened, kings, queens, and presidents exchanged felicitations and assured one another that new chains of friendship had been forged. Ten years later some of these potentates were at war, and their first act was either to seize or cut these cables—the symbolic chains that had been so happily forged in oratory. When the motion pictures became of international importance and Hottentots, Chinese, Argentinean gauchos, American cow-punchers, and Russian peasants rocked with laughter at the antics of Charlie Chaplin, and the whole world began to dress alike, thanks to the fashion in clothes set by Hollywood, it was even said that war was impossible. At last alien peoples could study one another's ways and thus understand one another. When broadcasting came it was the same. It seemed as if the millenium had come when the King of England or the President of the United States first talked to whole nations at once. Now it is necessary—at least in Europe—to curb broadcasting. With powerful stations strategically located it has actually become a menace to peace. The late Lord Bryce was one of the few who saw the effect of almost instantaneous communication on international peace. He expressed the opinion that without the telegraph and the telephone the World War might have been averted. As it was, Europe flashed electrically into an explosion. Passions were stirred over night. There was no time to deliberate. We Americans were swept against our will into that bloodiest of conflicts. "The world must be made safe for democracy" we cried. Look at the world now—fifteen years later. Never was democracy in such peril. It has disappeared in most nations of the world. Only in the United States, Great Britain, and France have its institutions and something of its spirit been preserved. Elsewhere a form of tyranny has taken its place.

Whatever the faults of my generation may have been I know that there was a better understanding among the nations of the world than there is now. In place of that understanding, primitive as it was, we see an evil thing, a disease called nationalism devouring the nations. Even science is not immune. The Russians boldly announce that objective science is a mild form of insanity, that science must serve the state, carry out the communistic program and that science for science' sake is meaningless. The present German Government holds similar views, with the exception that objectivity must yield to Nazi ideals. Mussolini has likewise proclaimed that a physicist, chemist, or biologist must be a good fascist first and a good scientist second. With art it is the same. Art for art's sake has lost its old validity. It is now Nazi art, communistic art, fascist art. We may have been easy-going and careless before the war. At least we were free. It is some comfort to know that in the home of modern democracy—the United States, Great Britain, and France—the old political institutions still survive and with them the freedom to conduct scientific research as we please and to paint pictures that are more than the compulsory glorification of a racial or an economic theory.

If I may judge from what the experts in the social sciences tell us, the period through which we are now passing is not just another period of distress. Yet my generation, with the exception of the more enlightened professors, talks of recovery. It is a bad word. It sug-

gests a return to some previous condition. Even a date is mentioned—the year 1926—a turning back of the hands of the economic clock. Not recovery but a new era is before us. We are evolving, but our evolution is planless in that we know not what the future has in store. If an engineer who started to build a bridge could not tell you whether it was to be a cantilever or a suspension bridge you would brand him at once as a bad engineer, a bad planner. Yet that is our position as social engineers. No one in Washington, London, Paris can tell you what will be the organization of society a generation hence. The Hitlers and the Mussolinis are not planners in the engineering sense. They wage a struggle against forces which they conceive to be inimical to society. They are conservatives whose faces are turned not forward to the future but backward to the past. They are reactionaires, not progressives.

My own generation is blind, I fear, to the implications of our present struggle with adversity—how blind was driven home to me recently by a symposium which was organized by Albert P. Sloan to discuss industrial progress in the next century. He had been told, it seems, that to many science and technology had reached the end of their possibilities. When and where this strange notion originated we were not told. However, it so impressed Mr. Sloan that he circulated among three hundred leaders of science and industry a request for their views on the century to come. We were given, then, three hundred previews of Utopia.

Out of the three hundred replies received not more than a score displayed any imagination or any social sense. To 90 per cent of these leaders Utopia was merely a happy land where markets were ever expanding, where consumers always had money, where there were no taxes, where legislatures never interfered with business, and where the chief function of the government was the maintenance of law and order. Invited to dream of the future these leaders persisted in dwelling in the present. They could not imagine a world without our pipe, our cement, our steel, or our hats and our shoes. Although they brushed aside the thought that scientific research had reached the end of its resources they were quite content with the world as it is.

I mention these three hundred because they probably represent the business community only too well. They have the inertia of my generation. They fail to realize that the world is in a ferment, that new ideas of social and economic justice are seething, that there is no turning back to what they undoubtedly call "the good old times." Yet it has always been thus. Man has always dreamed of Utopia, and when he dreamed it was always of a Utopia that was curiously familiar, except that there was no misery.

Utopia is not a fixed idea. Study all the Utopias that have ever been conceived, beginning with that of Plato and ending with those which H. G. Wells and others have pictured, and you will see how they have changed with the times. If you had asked a neolithic caveman for his conception of the ideal state he would undoubtedly have pictured something like an American Indian's happy hunting grounds. His Utopia would have been a forest in which game abounded. Dugouts would have been larger and more imposing, propelled by paddles of wondrous length by men of wondrous strength. All this would have been much more plausible to his fellow tribesmen than if he had insisted that he saw in a haze huge villages of stone inhabited by millions, and men and women voyaging in dugouts that had no oars and that vomited smoke from their entrails.

Two centuries ago, when famine might stalk through any country, Utopia was a land of plenty where mortals ate and drank from golden vessels and the very trees were good to eat. Judged by these standards we must be living in Utopia now; for though

the unemployed may be hungry it is not for lack of food.

As humanity acquired more and more science and introduced more and more inventions, Utopia changed. It is now conceived to be a land dominated by the scientist and the engineer. Its creators speak of possible artificial foods; of means of communication that will enable us to converse with, see, and —who knows?—even shake hands electrically with someone in Asia; of houses so highly mechanized that the mere pushing of a button will cook a meal or bring opera into every living room. Utopia is clearly a much more complicated place than it was when a full stomach was the sum total of human economic aspirations, simply because the business of living is becoming more and more intricate.

If you are willing to let the imagination roam it is easy to create Utopia. You will agree with me, no doubt, that with a mastery of the electron and the atom we will achieve a new chemistry and that the chemist of the future—a physical chemist—will think of reactions in terms of electronic energy. He will look upon our chemical triumphs, of which we are so innocently proud, as just a little less crude than the efforts of our ancestors at iron-making.

Perhaps you will also agree with me that rocket ships will cleave the air at speeds that make even the five hundred miles an hour now possible seem slow. As a consequence humanity as a whole will be much more nomadic. Florida will become a sort of winter playground for the whole northern United States. It will probably be necessary to set aside recreation areas in what are now inaccessible African and Asiatic wildernesses to which men may escape for the week-end from the strain of a civilization even more mechanical and artificial than ours. Bearing in mind that it has taken only a few centuries to bring the American Indian where he is today there is no reason to suppose that any so-called savage races will be left by the year 2300.

The Utopians among you who have specialized in physics will hesitate, as I do, to predict the speedy utilization of atomic energy. We postpone that, hopefully, for a still later era when an engineer in a power house will watch over apparatus which is designed to run all the factories of the country and which produce gold as a waste—something like ashes, to be carted off by some refuse-removing contractor, who will sell it because it is a good non-corrodible metal.

No doubt your great-great grandchildren will go to some technical museum with their grandchildren and be amused when their eyes alight upon a turbine of our day, a marvel to us. And no doubt these future graduates of the Carnegie Institute of Technology will say: "And that's the way they generated energy back in 1934? To think that they actually burned good coal to heat a lot of water, and that the water was changed into steam, and that the steam was supplied to this funny turbine, and that the turbine spun an electric generator, and that in this way energy enough was at last obtained to light lamps and drive factory wheels and run street cars! Why didn't they get the energy straight from the furnace, thermoelectrically as we do? And why didn't they do more with the photoelectric cell? Couldn't they see it turning sunlight into electric energy directly?"

You see how easy it is to create Utopias. But what are they? The United States of today, with more wonderful mechanisms. Note that we say nothing of social happiness, nothing of some spiritual goal that humanity is to attain. We take it for granted that there will be no poverty, no suffering, and plenty of leisure in which to enjoy ourselves. Fantastic as the mechanisms may seem to us now they are not nearly so vague as the method whereby strikes and wars are to be abolished and prejudices are to give way to sweet and general reasonableness. We are fine mechanical,

electrical, civil, and chemical engineers, but we are bad social engineers.

That there should be starvation while we do not know what to do with our too abundant wheat and cattle, that there should be overproduction when there is a need of more houses, more automobiles, more lamps speaks for itself. And that we should actually find it necessary to pay farmers not to grow wheat or raise cattle, that we should actually restrict production in every industry is not progress but reaction, not victory but defeat. Surely there is something quixotic in attempting to improve the condition of mankind by destroying values instead of creating them. A century ago we had an economy of scarcity. Now it seems that we are unable to cope with an economy of plenty and that we are trying to bring about a kind of artificial famine through legislation.

I do not wish to number myself among those rocking-chair philosophers who reproach their generation for its stupidity and have no constructive suggestions to offer. We obviously need a planned economy, but not of the kind that we now observe at work. Planning means foresight—in this case social foresight. But the planning with which we have become familiar of late is concerned more with an emergency than with the future.

What we need is clearly some way of integrating engineering and the social sciences. Up to the present the sociologists have dealt with past events. They have told us what happened after the steam engine, the railroad, the automobile became part and parcel of our lives. What we want to know is what will happen when new technical agencies are introduced. Don't tell me that I ask the impossible. Remember that the sociologists and economists speak of the "social sciences." They pride themselves on their acquisition of the scientific method. Prediction is the very essence of science. If a chemist or an engineer could not predict what will happen in a given set of technical circumstances we would regard him as a charlatan. So if the sociologists and the economists lay any claim to the title "scientist" we have a right to expect a certain amount of good prediction from them. At present they are called in only after the catastrophe has occurred or a condition become intolerable. They perform an autopsy, tell us of what disease poor industry died and suggest methods of prevention. Too late.

The fault for this lies in the ignorance of technologists of the social sciences and the ignorance of the sociologists and economists of technology. We know how such widely separated branches of science as bacteriology, medicine, and technology have been welded together to create the profession of sanitary engineering, which sees to it that our drinking water will not kill us and that our sewage is disposed of rationally. It is a similar coordination of the social and physical sciences which is manifestly needed. The scientific method must be applied to the solution of social problems. But since these social problems are concerned with the use of scientific discoveries and machines it is evident that they are also engineering problems. Hence the need of coordination.

For example, television is in the offing. It will probably be introduced within the next ten or twenty years. What will be its effect? Electrical engineers and social scientists must predict. We want to know now what television will do to us in 1944 or 1954. Is this so preposterous in the light of the vast experience acquired with the telephone, the telegraph, and radio communication? If airplanes are to skim through the stratosphere by 1950 at the rate of five hundred miles an hour, so that we can breakfast in Pittsburgh and dine in London the same day, have we not some right to know what the effect will be on passenger liners, on habits of life, on methods of doing business? Can we not dimly perceive what the spiritual effect of a new invention will be? We

want to make the utmost use of television and stratosphere planes when they are here and not to be told when they have been introduced that they have brought about a condition of economic ruin and social misery which makes it necessary to curtail their use.

I realize that it is not easy to predict the social and economic consequences that will follow the introduction of a new invention. Yet, when we see what is done by our great corporations in predicting the future—that is, their own commercial future—we see, too, that the task is not hopeless. It is senseless to restrict the James Watt of the future, as some would be inclined to do, because he may bring about what we grandly call technological unemployment, or to discourage a Bell because his telephone may throw telegraphers and messenger boys out of work. But it is also senseless to pursue the old laissez-faire policy—that is to let Watt and Bell invent and introduce their contrivances with no care of the consequences.

I do not expect perfection from this integration of the physical and social sciences. Luckily there is such a phenomenon as social inertia. That is, it takes time for a technical innovation to exert its full effect. It is this interval that I would use as the period of prediction. Long before the railroads were reduced to the verge of bankruptcy by the competition of highway transportation it was apparent that the motor bus and the motor truck would capture some of their passenger and freight traffic. Was it not possible for the sociologist and the engineer, working together, to foresee what has happened and to suggest door-to-door delivery and the streamlined train as solutions of the problem presented?

The very fact that no one can now predict the course of society for even so short a term as ten years shows what we need. It is clearly the same type of research that gave us the artificial environment on which I have dwelt. There was nothing haphazard about the development of the electric lamp, the telephone, the rolling mills of a steel plant. Experts conducted research. They planned and experimented. It is this method of research, of fact-finding, of experimentation that we need. The success of the Russian five-year plan is significant. We do not have to turn the government over to the experts in engineering and sociology and economics, but their advice should be a guide. I, for one, would certainly prefer to be aided by professors who constitute a so-called brain trust and who are experts in their field than by farmers, shopkeepers, and lawyers who are elected to Congress not because they are authorities on government, the social sciences, finance, or economics but simply because they are popular with their neighbors or because they promise a millenium that can never be attained. I want more brain trusts and not fewer, more men to conduct research into the scientific background of society, more facts about the past that have a bearing on the future.

There are signs that the integration, the coordination of the social sciences and technology is already under way. It is not so many years ago since Frederick W. Taylor, pioneer in scientific management, had great difficulty in convincing the American Society of Mechanical Engineers that engineering was concerned with the human element in industry. Now the Society has a management division. A goodly proportion of the papers presented at its meetings deal with the human or social problems of industry. A newer conception of the engineer's obligations is springing up—the conception of a duty to society. Several years ago the American Engineering Council adopted this definition of engineering: "Engineering is the science of controlling the forces and of utilizing the materials of Nature for the benefit of man, and the art of organizing the human activities in connection therewith." That goes far. But the time has come to go farther. The engineer must accept new

responsibilities. When he designs a machine it must be with a conscious purpose that transcends its usefulness in an industry. Its effect on life, on the community can no longer be ignored.

This coordination of the social and technological sciences which is to insure an earlier recognition of effects must begin in our universities and technical schools. For it is a coordination that demands a new social and technical approach, even a new science, a discipline which will drive home to engineers the need of a more orderly introduction of their contrivances and to sociologists the need of more careful study of present-day technical trends. Only occasionally are predictions now made by engineers and sociologists on the basis of their fact-finding. I would like to see theses for masters' and doctors' degrees devoted entirely to shrewd, dispassionate prediction, with graphs and a liberal amount of extrapolation to unfold the future.

But we must deal also with the politicians in our legislatures—the men who make our laws. In a democracy they must of necessity bow to the people. All this integration of technology and the social sciences for which I plead would be as useless as astronomy or relativity in creating the new era if the people themselves have no care of the social future. It is clear that the socially trained leaders who come out of the universities must have the active support of the populace. There must be a new standard of cooperative morality. We must be taught in schools, by newspapers and magazines to look upon ourselves not as independent units but as part of a vast complex social fabric which has a definite pattern and which is woven according to a well-conceived design. The platforms of our political parties, the speeches made in Congress would read and sound very differently if our national and international thinking were shot through with social purpose. Honest government, jails for gangsters, jobs for everyone, low rents, light taxes, brass bands in the parks, open spaces for the multitude, all the fine things that the political orators promise before election—we have the right to take these for granted. The candidate for senator or president for whom your grandchildren will vote will listen, I hope, to a social planner, a man with an engineering training who will actually exhibit charts in public, and indicate and discuss trends in chemistry and electricity, with an eye to their social effects.

I do not know what form the State of the future will assume. I can hope only that it will build on the fine and the true in a democracy like ours. For despite all our sins, particularly our sins of economic selfishness, we have attained much that is good. Obscure as the future may be it seems certain that some form of collectivism is emerging. If we are true to American ideals it will involve more cooperation than compulsion, although there will probably be a considerable enlargement of governmental functions and increasing State intervention.

Only five years ago I would have stood here in a less humble attitude. Out of the ripeness of what I would have called my experience I would have beamed on you benignly, wished you joy, and given you much the same advice that I received in my time as a graduate. But now, in this period of trial, with old political institutions put to the test, I look upon you not with condescension but with hope. You are pioneers of a new social era. It is not we but you who will fashion the world anew. There is work for you to do—real constructive, engineering work, with humanity as your raw material, human aspirations as your forces, and social happiness as your final product. Rise and do that work! It is your supreme duty not merely to gain a foothold for your individual selves but to create a better world than we knew, to mold human destiny. For us the night begins to fall. We are the sunset. You are the sunrise of a new social day.

PATRONS ART FUND PURCHASE

BULLFIGHT AT TUREGANO BY JOSÉ GUTIERREZ SOLANA

THE CARNEGIE INSTITUTE has recently acquired for the permanent collection through the Patrons Art Fund a painting, "Bullfight in Turegano" by José Gutierrez Solana, probably the most indigenous of Spanish painters. Already well known in Pittsburgh through his frequent representation in Carnegie Internationals, Solana was singled out for an award in 1933 when his painting "Procession" received an Honorable Mention.

The artist was born in Madrid in 1886. He studied art at the Academy of San Fernando in Madrid, entering at the age of fourteen. He has received numerous awards in Spain, among which are Third Medal awarded him at the National Exposition in 1917, and a Gold Medal in 1922. The painting which won the Gold Medal, "The Return from Fishing," now hangs in the Modern Fine Arts Museum at Madrid. As a painter he is traditionally Spanish in vision and in style. Like Velásquez and Goya, who strongly influenced his early work, he is interested in painting certain types and customs characteristic of Spanish life. In his color, subject, and technique he reveals a Spain little known to the remainder of the world. Solana will be represented in the 1934 International.

This is the thirty-second painting which the Institute has been able to acquire through the Patrons Art Fund. The plan of the Fund was first instituted in 1922, when the late Willis F. McCook offered to give $10,000 in ten annual installments for the purchase of paintings and other works of art, provided that nine other art patrons were found who would match his gift. These conditions were not only met but ex-

ceeded when fourteen subscribers pledged duplicate sums. The membership now numbers twenty-one and includes the following names: Mrs. Edward Houston Bindley; Paul Block; George W. Crawford; B. G. Follansbee; Mrs. William N. Frew, in memory of William N. Frew; Mrs. David Lindsay Gillespie and Mabel Lindsay Gillespie, in memory of David Lindsay Gillespie; Howard Heinz; Mary L. Jackson, in memory of her brother John Beard Jackson; George Lauder; Albert C. Lehman; Willis F. McCook; Andrew W. Mellon; Richard B. Mellon; William Larimer Mellon; F. F. Nicola; Mrs. John L. Porter; Mrs. Henry R. Rea; William H. Robinson; Ernest T. Weir; Emil Winter; Mrs. Joseph R. Woodwell and Mrs. James D. Hailman, in memory of Joseph R. Woodwell.

TAYLOR ALLDERDICE

1863-1934

In the death of Taylor Allderdice, which occurred on May 20, the Board of Trustees of the Carnegie Institute lost the services of one of its most valuable and valued members. During the term of his trusteeship, from January 8, 1912, until the day of his death, Mr. Allderdice gave unsparingly to the Institute of his time, his ability, and his energy. In those twenty-two years he served on each of the Institute Committees for various terms, having been a member of the Fine Arts Committee for the entire period and chairman of Music Hall Committee for the past thirteen years.

This is an imposing record of his service. It is especially so to those who were closely associated with Mr. Allderdice and who knew that to him membership on a committee called for much more than mere passive attendance at meetings. It was his belief that a trustee of the Carnegie Institute should bring to its problems the same thoughtful consideration he would give to his own business affairs, and this belief he put into practice. He never shirked a responsibility and his decisions, always made only after careful thought and—if necessary—investigation, were founded on intelligent study, and for that reason always of great benefit.

In his attitude toward communal affairs, Mr. Allderdice displayed the

same fine spirit of civic responsibility and a willingness to accept—frequently at personal sacrifice—positions of leadership in movements looking toward the betterment of the community. His presence in these movements was always an inspiration and his untiring efforts served as an example for others.

Men of energy and force too often become self-centered and unapproachable. Taylor Allderdice was not of this type. Indeed, his most outstanding characteristic was a genial, cordial personality. The Carnegie Institute will miss his splendidly unselfish service. But above all he will be missed by a countless host who loved him as a friend.

[This memorial minute was written by Augustus K. Oliver, a fellow trustee.]

THE GARDEN OF GOLD

LETTERS, letters, letters! Jason—look at our mail! And how friendly! Why are we away? How long will we stay? Where have we gone? This one—this one—this one! Who will tend our beautiful Garden of Gold? I didn't know what friendship was until now."

Jason, who lacks something of Penelope's vivacity, scanned the letters carelessly but with real pleasure.

"I'm glad to be called back," he said. "There is no garden in all the world like ours—one where money is planted and instantaneously shoots up, three dollars for one. Look at our situation, Penelope. Those good people in New York saw that this Pittsburgh enterprise was a success. They saw that the time would soon come when that enterprise—our great school—must reach maturity of years, and take care of itself, or be taken care of by its sons and daughters, and by its friends in the community; and so they did a thing which really caused the creation of this Garden of Gold."

"What was that, Jason?"

"They said that they would grant us twenty-five years in which to build up this sustaining approbation from these other friends; and as an evidence of good will they gave us $7,000,000."

"Did they really give us $7,000,000 in cash, all at once?"

"Yes, in 1921. Then they said that at the end of twenty-five years they would give us $8,000,000 more, provided that we would during that time obtain from these local friends $4,000,000. That is to say—now listen, Penelope—that for every dollar we would obtain in twenty-five years, up to $4,000,000, they would pay us two."

"Oh, I see!" cried Penelope. "That did create a Garden of Gold! Each dollar planted during any part of twenty-five years will yield two others."

"But that is not all, Penelope. These gifts of dollars are invested here in Pittsburgh, and all their income is added to our principal; and those New York people will pay us two dollars for every one on all these interest earnings."

"An unusual, a wonderful situation," gasped Penelope. "What will we do with all that money?"

"If we get our $4,000,000"—

Penelope interrupted him. "There must be no ifs about it, Jason!"

"There won't be. We shall get it, of course. In fact, we already have half of our first million. Why, this 1946 gift will give us a new endowment fund of $12,000,000, yielding a new income of $600,000 a year forever for our Carnegie Institute of Technology. Just think how we can develop that great school with such an addition to its financial strength! New buildings, new equipment, new ideas, new researches, new inspirations for the young men and women who are filling our study halls—the leadership of a scientific and artistic age in America!"

"I'm glad they called us back," said Penelope. "The Garden of Gold does indeed need tending—it does indeed need planters and gleaners. With a harvest like that ahead of us—Jason, let's stay on the job!"

GOLDEN FRUITAGE

Carnegie alumni and Carnegie students both feel the responsibility of attaining the endowment goal and constantly give reason to prove their faith in its fulfillment by sending contributions. From the Mens Dormitory Council comes $50, and from the class of 1918 of the Margaret Morrison Carnegie College is a gift of $150. These sums will grow in the usual expanding way.

The total gifts recorded in the Magazine since its inauguration over seven years ago now amount to $1,080,116.44.

THE FELLOWSHIP OF ART

By Homer Saint-Gaudens

Director of Fine Arts, Carnegie Institute

[Mr. Saint-Gaudens will be back in Pittsburgh shortly, after spending three months abroad assembling pictures from thirteen countries for the coming International Exhibition, which opens at the Institute on October 18. The following talk was given on May 7 at the Royal Academy Club banquet in the Painters and Glaziers Hall located in the center of London. It is a tradition that the Royal Academy was an outgrowth of the Painters and Glaziers Guild. In keeping with this tradition, the president of the Guild sits at dinner on the right of the president of the Royal Academy.]

I FEEL complimented tonight in being asked to reply for the visitors, both because I regard myself as an old visitor, having been here before, and because on that former occasion you had patience with what I had to say to you.

I am not well acquainted with the other visitors. Yet I know they feel as I feel proud to be here with you, and in my case, in England.

For myself only a short time ago, in my quest for pictures for the International Exhibition of Paintings that we hold in Pittsburgh, I was on the Continent with our European representative, a Frenchman by the name of Guillaume Lerolle.

We had been to Berlin, Stockholm, Oslo. Eventually we were in the station in Amsterdam. There, as the porter picked up our luggage, Lerolle remarked, "They seem to speak fluently hereabouts, only I don't know what language."

But I do know your language, and I trust you know a little of mine. For you English and we Americans have great similarities, though great differences. So long as we appreciate the similarities and are amused by the differences we can feel much at home in each other's purlieus.

This comparing of notes has become an obsession in my country.

It obtains with our painters as well as with our plumbers. In my boyhood days our artists felt that their education required a year or two abroad. Now they believe that America is the place in which to study American art, just as you believe that England is the place to study English art. But once our painters have fitted themselves with their professional boots they are keen to explore other points of view. That is why I come every year to collect pictures from the various countries on this side of the Atlantic.

I wish you could know our painting as I believe in a measure we know yours. Perhaps that may come to pass some day. I can imagine a no more congenial task than to introduce you to what we are trying to achieve.

But more than that, I would have you know our painters. There would be few of those differences and many of those similarities.

Yet even more, may I speak for all painters, since I, who was virtually born in a studio, wishing I were an artist, year in and year out, in various and sundry lands, climb stairs to high north lights, disassociated from the noises of the streets below, where I find you all the same, the most sincere, the most generous of castes.

If I could bring here tonight such men as Sunyer of Barcelona, or Carena of Florence, or Hofer of Berlin, or Liljefors of Sweden, if somehow I could demolish the damage which was

wrought so long ago in the vicinity of the Tower of Babel, you would find at this common board an intimacy that has never existed in any other trade or profession.

For example, in awarding the prizes of our exhibition, we have assembled for years international juries, where a Greiffenhagen of England might be placed side by side with a Matisse of France. Never in such a jury room have I seem any atom of that ill-tempered insistence on the fact that this was right or that was wrong which I have met so often on the part of the critics or the public.

Naturally the externals of your art are different here and elsewhere. They should be, for as it is your function to hold up the mirror to mankind, so as the social elements about you vary, your reflections vary.

In Spain art reflects a cheerful young bourgeoisie.

In Italy art is official and unified.

In Germany, Nazi or no Nazi, art is introspective, but growing year by year a bit more gracious despite a flaunting of the swastika on the red banner.

In France art is shaking down into the middle of the track, sobered by the realization of the need of a greater insistence on matter and of less exploitation of manner as an end in itself.

In England you of the Royal Academy impress a wanderer with the dignity of an established organization, sufficient to itself, serene; an organization that has never lost its hold on the fact that a picture must somehow hang upon its subject.

The "idea" permeates every phase of your art. You set this forth with proper craftsmanship, for yourselves and for nobody else.

You do your best to decorate the lives of your fellow countrymen instead of your own ego. I, the son of a man who considered himself greatly complimented by being named by you an Honorary Foreign Academician, believe you are wholly on the right track.

I am a little appalled to think how soon my days here in England will be over; for they are a relief after much artistic bedlam.

Sometimes I wonder in my travels as to the reality of the whole affair. Lerolle not long ago told me a story of a man in a train between Paris and Saint-Germain who had on his knees a little black bottle. About once a kilometer he would tear a scrap off a a newspaper, dip it in the bottle, and throw the result out of the window.

Whereat the traveling salesman opposite, whose curiosity could no longer be restrained, asked what it was all about.

"This," said the man with the bottle, "is Flick-Flox, and Flick-Flox is to elephants what Fly-Tox is to flies. It kills 'em."

"But," said the salesman, "there are no real elephants around here."

"I know it," replied the other, "but this is not real Flick-Flox either."

Well, that is what I have been facing in the past and that is what I must face again in the very near future.

Naturally, then, I do not wish to leave you, except to go home. I would be happier if a few weeks hence I might sail from Southampton rather than from Cherbourg. Then the ocean would not be so wide.

YOUNG VISITORS

DURING the month of May 4,810 pupils representing seventy-eight Pittsburgh schools were given natural history and fine arts instruction at the Carnegie Institute. In addition to this attendance 2,242 boys and girls visited one department or the other for particular study. The Saturday Morning Drawing Class for Children with Special Ability closed on Saturday, May 26. This year there were twenty-seven lessons, with a total attendance of 12,493. The Saturday Afternoon Museum motion-picture programs closed on April 7, with a total attendance for the twenty-two programs of 11,155;

THE JEOPARDY OF CULTURE

Excessive taxation is not only menacing the culture of the American nation; it has already impaired it. If this destructive malady is not arrested, democracy itself is at stake. The graphic statement shown on the opposite page—speaking in eloquent silence—reveals with what deadly effectiveness taxation, like a worm in the bud, is eating the substance out of our country. But the picture does not tell the whole story. In addition to the taxes collected, the Government is spending staggering sums from borrowings and from reserve funds; and when we add to the national expenditures—as shown in the "pie"—the city, county, and State disbursements in all the States, we have this table:

1923.....	$ 9,920,000,000
1929.....	13,048,000,000
1933.....	13,500,000,000

In other words, these figures show that in the year just past the cost of all government operations has absorbed over one third of our national income.

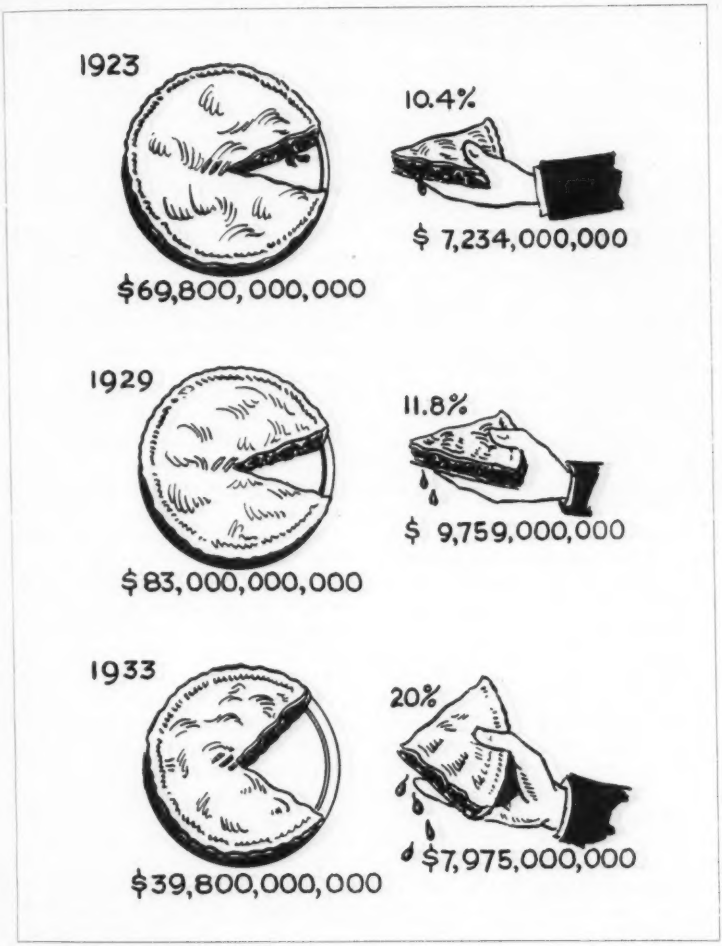
This condition has led the nation to become panic-stricken against any further support of its educational system as that system exists today when, if we would but study the conditions, we would see that our country as a whole has never yet provided even a common-school course for all of its children, and that this national extravagance should not be mitigated by any reduction in the cost of our schools.

If we view the facts for Pennsylvania alone, we find that the number of children in school has increased; that the number of teachers has decreased; that classes in many instances are too large for effective instruction; that revenues from local school taxes are decreasing; that unpaid salaries of teachers exceed $2,000,000; that thousands of our children are denied high-school opportunities because the districts cannot pay tuition; that taxpayers in certain areas are clamoring for a reduction in taxes and, in others, are threatening the nonpayment of taxes unless educational facilities are curtailed; that the essential fundamentals of art, music, and health are being eliminated; that a movement has already gained attention based upon the question, "Can we afford the high school?"

This is Pennsylvania, where Thaddeus Stevens in 1835 pleaded that the blessing of education should be conferred on every child in the State—"shall be carried home," he said, "to the poorest child of the poorest inhabitant of the meanest hut of your mountains, so that even he may be prepared to act well his part in this land of freemen." Many other States are in worse shape, and but few, if any, are better off.

The cause of this intellectual decline is overbuilding and overmanning the country. Roads and structures show the construction, and it is stated that one citizen out of every ten enjoys a political job which the people pay for. It goes without saying that the functions of government must not be neglected. Order, health, education, transportation, justice, and defense must have attention. But on October 12, 1932, a statement was issued by a group of men comprising Calvin Coolidge, Alfred E. Smith, Elihu Root, Newton D. Baker, John J. Pershing, and William S. Sims, in which this imperative warning appears:

> Unless the people through united action arise and take charge of their government, they will find that their government has taken charge of them. Independence and liberty will be gone and the general public will find itself in a condition of servitude to an aggregation of organized and selfish minorities. When that day comes our political and economic system will neither merit nor command the respect and support of the people, and universal bankruptcy and anarchy will prevail. If we are to be saved from that catastrophe, we must join in organized service, organized sacrifice, and organized patriotism.



Courtesy "The Tax Digest"

The perils here shadowed forth are already being realized. Excessive taxation is doing all that these distinguished citizens said that it would do. The homes of our people are crumbling into the abyss of political extravagance as the homes of the ancient Romans crumbled into the abyss of Marcus Curtius. And when a man loses his stake in the common land of his country, bankruptcy and anarchy do prevail. But he must not be saved from bankruptcy and anarchy by condemning his children to the darkness of ignorance.

We spoke of Marcus Curtius. Who is there among us to redeem our country from this palpable and terrifying destruction even as Marcus Curtius rescued Rome?

"THE PLAY'S THE THING"

Reviews of John Galsworthy's "The Skin Game" and Maurice Ordonneau's "Les Boulinard"

By Harold Geoghegan

Professor of the History of Art, Carnegie Institute of Technology

As its final production of the present season the Department of Drama offered us John Galsworthy's "The Skin Game." It is an effective, if somewhat old-fashioned play, very characteristic of its author.

Elmer Kenyon, in an interesting communication, sees in it an allegory of the Great War, with the landowner Hillcrist representing England, the upstart Hornblower Germany, and the cottager Jackman—the ostensible cause of the struggle—Belgium. Whatever the author intended—and one frequently suspects symbolism in Galsworthy's work—the allegory fits it very neatly.

The plot concerns Hornblower, a successful and very self-made man from the north, who has come south and established his factory in the peaceful village where the Hillcrists have been lords of the manor for a century or so. The factory and the business methods of the manufacturer have changed the tenor of the rather improbably patriarchal community, and the Hillcrists bitterly resent the change. The Hornblower family are cut by the County, and they don't like it. Some former tenants of Hillcrist, the Jackmans, are turned out of their cottage by the manufacturer in spite of a promise made to Hillcrist before buying the property. There is a scene of recrimination between them and the Skin Game begins!

Hornblower makes the first move by buying, for a fantastic sum, a piece of land on which he intends to erect a new factory which, with its smoke and fumes, will completely ruin the Hillcrist property. Then Mrs. Hillcrist, a most disagreeable lady, discovers the scandalous past of Hornblower's daughter-in-law Chloe, and threatens to make the knowledge public. Hornblower's hand is forced; but the secret leaks out all the same. Chloe, her happy marriage broken, attempts to commit suicide. The Hillcrist's "desire is got without content." The play ends in deadlock. Both sides have touched pitch, and both have been defiled. "When we began this," says Hillcrist to his understanding daughter Jill, "we had clean hands. Are they clean now? . . . What's gentility worth if it can't stand fire?"

If "The Skin Game" is an allegory of the War, no one can accuse Galsworthy of jingoism. Hillcrist-England and Hornblower-Germany are equally to blame; both get a fair deal. As in all his other plays and all his novels, he refuses passionately to take sides.

What the author thinks about it all is, I think, put into the mouths of the two young people, Jill Hillcrist and Rolf Hornblower, who try in vain to bridge the gulf dividing manor and factory. The author sympathizes with gentle Mr. Hillcrist and with the much-tried Chloe, but he is not on the side of either, though he is terribly distressed.

From the point of view of drama, "The Skin Game" might have been a better play if the author had ranged himself on one side or the other, but that was never Galsworthy's way.

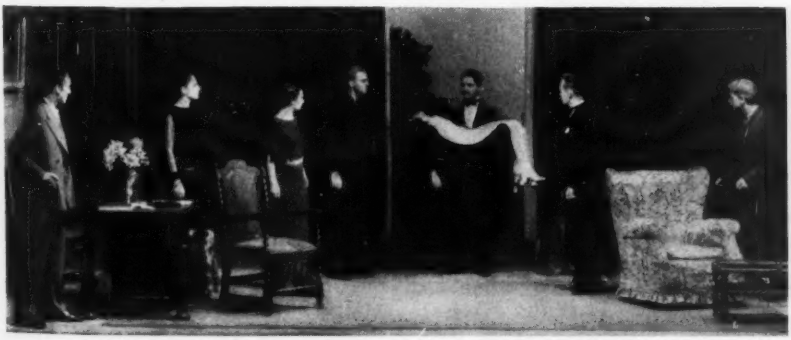
The play is constructed on rather outmoded lines, in the manner of Pinero

without Pinero's technical skill. There are spots where it turns definitely melodramatic. The manner in which Chloe's past comes back to smite her is not very plausible, nor is it quite clear how Mrs. Hillcrist in her peaceful English village developed such remarkable sleuthlike qualities. Is there any dramatic reason for the character of the spying maid Anna, who makes no use of her discoveries and is not apparently working for either side? The most interesting scenes, if the least dramatic, are those between Hillcrist and Jill. Galsworthy's technique seems to be that of a novelist rather than a dramatist.

"The Skin Game" was given an adequate performance. One hardly expected the atmosphere to be very English. It wasn't. It seems to be an immutable law on the stage of our Little Theater that any Englishman over forty must wear a morning coat and a wing collar on all occasions. Such, in my experience, is not the case. Indeed, I doubt if Mr. Hillcrist would ever wear one in the country except at church. Another law is that all older English ladies carry lorgnettes. I wonder!

The play was, as usual, double cast. In the performance which I saw, Mr. Hillcrist was sympathetically played, and there was a very neat sketch of the voluble Mrs. Jackman. She had a most convincing Cockney accent. Much more convincing than the Yorkshire—or was it Lancashire?—of Mr. Hornblower, who apart from his obvious youth, was plausible enough. The Chloe was a lovely apparition and effective in the conventionally written part. I have rarely seen anyone quite so haughty as the Mrs. Hillcrist. By comparison, Lady Clara Vere de Vere might be considered a good mixer.

The Department of Modern Languages stepped into the dramatic arena last month in a spirited performance of Maurice Ordonneau's "Les Boulinard." This farce—it can hardly be called a comedy—is one of the many descendants of "Le Voyage de Monsieur Perrichon." The plot never even skirts the borders of probability, although the characters are amusingly drawn and have some relation to life. Considering the difficulties the actors must have experienced in playing in a language not their own, the performance was a creditably smooth one, and Professor Parisi and Miss Frances King, who were responsible for the production, have every reason to congratulate themselves. The French, though here and there of the Stratford-atte-Bowe variety, was surprisingly fluent and comprehensible, and the voice of the prompter was not nearly so much in evidence as is usual in performances of the kind. Several of the parts were played with a nice appreciation of their comic values, notably those of the pompous M. Boulinard and his outspoken wife.



SCENE FROM "THE SKIN GAME"—STUDENT PLAYERS

LUCUBRATIONS OF A SOOTHSAYER

Sometime in 1902 in the drawer of an old desk in the Overholt Distilling Company at Bradford, Pennsylvania, a chart was found which even then showed signs of age, and which presented in graphic form a study of all the periods of prosperity and of adversity, respectively, in the United States from 1810 to 2000. Some notations on the chart indicated that it was at that time perhaps twenty-five years old; and the economic studies showed such an amazing accuracy of prognostication that copies were made and distributed to various persons, and soon, through the courtesy of Judge Elbert H. Gary, it came into my hands. I kept it for a few years, lost it, and have just now found it again.

Every panic that has occurred in this country from 1810 to 1929 is here set down in such a way as to show Panic, the insidious foe of prosperity, not only at the year of his arrival but in his creeping and inescapable approach through one or more of the preceding years. For instance, our affairs were in pretty bad shape, as everyone remembers, at the beginning of 1914; but eighteen months later, with the World War a year old, the line is rising fast and it reaches the top by 1920—and let us not forget that all this is told through economic prophecy. Then came the railroad-shop strike and the line goes down—not very deep, but deep enough, until 1924. Then it starts up toward an unexampled height in 1929, whence it goes down, reaching the very bottom of the chasm in 1933; and then—joy to the world!—it starts back, even through a fog of doubt, until the heights of a new prosperity for labor and capital are arrived at in 1935, and America stays at the peak until 1940, with everybody enjoying the benefits of a greater wealth.

But our soothsayer grants us no financial tranquillity to be gained by harsh experience; he gives us no escape from a continuation of these gorgeous heights and anxious depths, for the line starts down in 1940, reaches a half-way descent by 1942, goes back to a brief recovery, and then seeks a deeper abysmal profundity in 1945; and happy days will not come again until 1953. Running through the chart to its conclusion, we find a depression in 1965, prosperity in 1972, panic in 1981, wealth in 1989, panic in 1996, and a burst of glory at the end of the century in 2000. In all the down years he says we are to buy houses, stocks, and bonds, but he warns us to sell everything when the top is reached.

The chart is a clever achievement evidently based upon an economic law which its unknown author had worked out painstakingly for himself, and showing that regardless of peace or war, time or tide, feast or famine, or any other thing, the ups and downs of life swing through the heart of our nation in cycles which come and go with the inevitable regularity of the planets.

SECRETARY WALLACE'S WORLD RELIGION

While we do not agree with the agricultural policy of Henry A. Wallace, President Roosevelt's Secretary of Agriculture, and believe that that policy is driving our country into irreparable confusion, we do agree with Mr. Wallace's religion. In a recent article from his pen he says:

> The world is now ripe for a type of religion which is truly catholic in the original sense of the term. I wish in some way it might be so universal as to embrace Buddhists, Mohammedans, Jews, and Protestants, as well as the Catholics.

Mr. Wallace's appealing idea is nothing more nor less than the fundamental religion which was given to the world by the Jewish prophets and confirmed by the gospel of Jesus—Love God, and thy neighbor as thyself. Out of the perversion of this broad faith have flowed wars, massacres, burnings, destructions, and the atrocious persecutions of the Jews. Yet it was the Jews who gave us their religion and its greatest leader, when all the world was pagan.

If Mr. Wallace will abandon his fallacious farm policy and mount the platform to promote a generous religion so simple in its emphasis upon God and Neighbor that the whole world will hungrily accept it, he will take his place with Isaiah and Amos, and we shall have peace.

THE WAR DEBTS AGAIN

As time goes on, the war debts are becoming more and more an irritating question, and things are being said in some of our newspapers which, if reprinted abroad, will offend good taste and good manners. President Roosevelt in his recent message to Congress reminds the delinquent nations that these loans enabled them to maintain their national life and repulse the invaders of their homes. But the money did something more. It enriched our labor with steady work and filled the coffers of our factories with profits high above the normal scale. Beyond that, it kept intact for fifteen months the battle line of what was now our own war while we prepared our raw recruits for our own defense.

And there is yet another point to be considered in the larger study of this vexing question. When the German ambassador, Count von Bernstorff, returned to the United States in October, 1914, he gave out an inspired interview to the American newspapers, in which he cautiously but definitely revealed that Germany intended to tear Canada away from the British Empire and annex it as a German colony. This statement provoked so much resentment in America that the ambassador explained it away in the usual diplomatic language; but the disclosure of such a purpose was enough to show our people that the Allied Powers were even then, long before our entrance into the War, defending our national interests and our national policy.

People who look at these loans in a superficial way are apt to remark that some of these nations have an abundance of gold, and that they should therefore pay their war debts instead of spending their money for armaments. Putting aside the threats to peace which have induced our own Government to embark upon an enormously costly increase of armament, there is a great difference between spending money for war implements and using it for the payment of the war debts. Money spent in England and France for armament is spent from income and circulates among the people of those countries in wages, returning to the national treasuries, in large part at least, as taxes; while money taken from a treasury surplus to pay war debts is a permanent diminution of national capital, and a consequent impoverishment of that nation.

From Adam Smith down to the latest aspiring student's graduation address there is but one way known by which a nation can pay a substantially large indebtedness to a foreign country, and

that is by the exchange of goods. But after notifying these other nations that they were expected to pay the war debts promptly, we adopted Prohibition and increased our tariff duties to a point which made the interchange of goods impossible. And these neighbors of ours—these companions in arms who fought our war in our absence for fifteen months—are far too wise in the lore of Adam Smith to transfer their gold to us at the cost of bankruptcy and invasion.

RADIO TALKS

[*The sixth series dealing with natural-science subjects of local interest, entitled "The Naturalist—Afield and at Home," broadcast over WCAE every Monday evening at 6 oclock under the auspices of the Section of Education of the Carnegie Museum.*]

JUNE

25—"Sharks and Their Taking Ways," by Arthur W. Henn, curator of Ichthyology.

JULY

2—"Man and His Pets," by Stanley T. Brooks, curator of Recent Invertebrates.

9—"A Naturalist in the Mountains," by Edward H. Graham, assistant curator of Botany.

16—"A Few Finds in Fierro, New Mexico," by Jane A. White, assistant curator of Education.

23—"Parasites in Man," by Dr. Brooks.

30—"Parasites on Man," by Dr. Brooks.

AUGUST

6—"Botanizing in the Summer," by L. K. Henry, assistant in the Section of Botany.

13—"Subterranean Insects," by F. W. Miller, assistant in the Section of Entomology.

20—"A Naturalist in the Desert," by Dr. Graham.

27—"Nature in Late August," by O. E. Jennings, curator of Botany.

THE PURSUIT OF LEARNING

The mature student should be encouraged to take an aggressive attitude toward learning, instead of merely allowing himself to be pursued by it.

—CARL E. SEASHORE,
State University of Iowa

GIANTS

It is always well to remember that there are giants in our own day, too.

—ANDREW CARNEGIE

CARNEGIE INSTITUTE

SAMUEL HARDEN CHURCH, President

GEORGE F. SHEERS, Auditor
J. C. JEFFRIES, Assistant Auditor
WILLIAM A. MORTEN, Assistant Treasurer
MINNIE C. RANKIN, President's Secretary

DEPARTMENT OF FINE ARTS

HOMER SAINT-GAUDENS, Director
EDWARD DUFF BALKEN, Acting Assistant Director
JOHN O'CONNOR JR., Business Manager
GUILLAUME LEROLLE, European Representative
ANNE K. STOLZENBACH, Secretary
MARGARET M. LEE, Director of Educational Work

CARNEGIE MUSEUM

ANDREY AVINOFF, Director
STANLEY T. BROOKS, Curator of Recent Invertebrates
ARTHUR W. HENN, Curator of Ichthyology
O. E. JENNINGS, Curator of Botany and Director of Public Education
HUGO KAHL, Curator of Entomology
M. GRAHAM NETTING, Curator of Herpetology
SYDNEY PRENTICE, Draftsman
R. H. SANTENS, Chief Preparator in Zoology
W. E. CLYDE TODD, Curator of Ornithology
I. P. TOLMACHOFF, Curator of Invertebrate Paleontology

CARNEGIE MUSIC HALL

MARSHALL BIDWELL, Organist and Director of Music
ROY B. AMBROSE, Manager

CARNEGIE LIBRARY

RALPH MUNN, Director
ADALINE BERNSTEIN, Head of Order Department
WALLER I. BULLOCK, Adult Lending Department
MARY E. FOSTER, Schools Department
ELLWOOD H. MCCLELLAND, Technology Librarian
RUTH D. MCCOLLOUGH, Catalogue Department
CHARLES W. MASON, Readers Counselor
ARTHUR D. SCOTT, Printing and Binding Department
ELVA S. SMITH, Boys and Girls Department
IRENE STEWART, Reference Librarian
MARTHA V. WIRTH, Executive Secretary

DEPARTMENT OF BUILDINGS & GROUNDS

ROY B. AMBROSE, Manager

CARNEGIE INSTITUTE OF TECHNOLOGY

THOMAS S. BAKER, President
ARTHUR C. JEWETT, Director, College of Industries
WEBSTER N. JONES, Director, College of Engineering
GLENDINNING KEEBLE, Chairman of Faculty, College of Fine Arts
CHARLES WATKINS, Director, Margaret Morrison Carnegie College
R. M. IHRIG, Director, Division of General Studies
ALAN BRIGHT, Registrar
RALPH MUNN, Director, Carnegie Library School
FRANCES H. KELLY, Associate Director

CARNEGIE INSTITUTE COMMITTEES†

MUSEUM COMMITTEE

George H. Clapp, *Chairman*

Marcus Aaron	James R. Macfarlane
F. R. Cogswell	Augustus K. Oliver
Frank J. Lanahan	John B. Semple
James H. Lockhart	George E. Shaw
William N. McNair	William P. Witherow

FINE ARTS COMMITTEE

George E. Shaw, *Chairman*

W. S. Arbuthnot	Albert C. Lehman
J. Frederic Byers	A. W. Mellon
George H. Clapp	Richard K. Mellon
William Frew	John L. Porter
Howard Heinz	A. Bryan Wall

William Watson Smith

INSTITUTE OF TECHNOLOGY COMMITTEE

John L. Porter, *Chairman*

F. R. Cogswell	Frank J. Lanahan
William Frew	James H. Lockhart
Robert Garland	James R. Macfarlane
*J. C. Hobbs	*Roswell Miller
Roy A. Hunt	William S. Moorhead
*F. B. Jewett	Augustus K. Oliver

*Charles E. Wilson

(*Special members)

AUDITING COMMITTEE

Frank J. Lanahan, *Chairman*

John J. Kane	William J. Soost

FINANCE COMMITTEE

A. W. Mellon, *Chairman*

Howard Heinz	John L. Porter
Roy A. Hunt	William Watson Smith

PENSION COMMITTEE

W. S. Arbuthnot, *Chairman*

Charles Anderson	Thomas J. Gallagher
Robert A. Franks	John J. Kane

MUSIC HALL COMMITTEE

William P. Witherow, *Chairman*

W. S. Arbuthnot	George W. Crawford

William J. Soost

CARNEGIE LIBRARY COMMITTEES†

LIBRARY COMMITTEE

Marcus Aaron, *Chairman*

Robert Garland	William S. Moorhead
William A. Magee	William Watson Smith

BUILDINGS AND GROUNDS COMMITTEE

William N. McNair, *Chairman*

Charles Anderson	Thomas J. Gallagher
Arthur E. Braun	P. J. McArdle

FINANCE COMMITTEE

A. W. Mellon, *Chairman*

Roy A. Hunt	William Watson Smith

AUDITING COMMITTEE

Frank J. Lanahan, *Chairman*

John J. Kane	William J. Soost

ADVISORY COMMITTEE

S. H. Church	George H. Clapp
John L. Porter	George E. Shaw
A. W. Mellon	W. S. Arbuthnot
Augustus K. Oliver	William P. Witherow
Robert Garland	Marcus Aaron
Roy A. Hunt	William N. McNair

Frank J. Lanahan

†The President is ex-officio a member of all Committees.

BOARD OF TRUSTEES
WHO'S WHO

Under the Charters the same Trustees serve both the Carnegie Institute and the Carnegie Institute of Technology, and eighteen of them (starred) are also Trustees of the Carnegie Library.

SAMUEL HARDEN CHURCH, *President*
JOHN L. PORTER, *Vice President*
AUGUSTUS K. OLIVER, *Secretary*
ROY A. HUNT, *Treasurer*

*MARCUS AARON
University of Pittsburgh. President Pittsburgh Board of Public Education. Museum, Library, Advisory.

‡TAYLOR ALLDERDICE
Lehigh. Manager Carnegie Hero Fund Commission. Board of Public Education. Museum, Art, Music Hall, Advisory.

*CHARLES ANDERSON
City Council. Pension, Buildings and Grounds.

WILSON S. ARBUTHNOT
Princeton. President Arbuthnot-Stephenson Company. Art, Pension, Music Hall, Advisory.

CHARLES D. ARMSTRONG
President Armstrong Cork Company.

*ARTHUR E. BRAUN
President Farmers Deposit National Bank. Buildings and Grounds.

*J. FREDERIC BYERS
Yale. Chairman A. M. Byers Company. Art.

*S. H. CHURCH
Director Pennsylvania Railroad—Western Companies, Blaw-Knox Company. Trustee Carnegie Corporation of New York.

GEORGE H. CLAPP
University of Pittsburgh. President Board of Trustees University of Pittsburgh. Museum, Art, Advisory.

FREDERICK R. COGSWELL
Carnegie Institute of Technology. Director Traffic Promotion Pittsburgh Railways Company. Museum, Tech.

*GEORGE W. CRAWFORD
Chairman Columbia Gas and Electric Corporation. Music Hall.

ROBERT A. FRANKS
Vice President and Treasurer Carnegie Corporation of New York. Pension.

WILLIAM FREW
Yale. Moore, Leonard and Lynch. Art, Tech.

*THOMAS J. GALLAGHER
City Council. Pension, Buildings and Grounds.

*ROBERT GARLAND
President of City Council. President and Treasurer Garland Manufacturing Company. Library, Tech, Advisory.

HOWARD HEINZ
Yale. President The H. J. Heinz Company. Director Pennsylvania Railroad Company. Art, Finance.

*ROY A. HUNT
Yale. President Aluminum Company of America. Tech, Finance, Advisory.

*JOHN J. KANE
City Council. Pension, Auditing.

*FRANK J. LANAHAN
President Fort Pitt Malleable Iron Company. President American Foundrymens Association. Tech, Museum, Auditing, Advisory.

ALBERT C. LEHMAN
Harvard. President Blaw-Knox Company. Art.

JAMES H. LOCKHART
Princeton. Vice President Lockhart Iron and Steel Company. Tech, Museum.

*P. J. MCARDLE
City Council. Buildings and Grounds.

JAMES R. MACFARLANE
Princeton. Board of Public Education. Museum, Tech.

*WILLIAM N. MCNAIR
Mayor of Pittsburgh. Gettysburg. Law School University of Michigan. Buildings and Grounds, Museum, Advisory.

*WILLIAM A. MAGEE
City Council. Library.

*ANDREW W. MELLON
University of Pittsburgh. Art, Finance, Advisory.

RICHARD K. MELLON
Princeton. President Mellon National Bank. Director Pennsylvania Railroad Company. Art.

*WILLIAM S. MOORHEAD
Yale. Law School University of Pittsburgh. Moorhead and Knox. Tech, Library.

AUGUSTUS K. OLIVER
Yale. President Board of Trustees Shadyside Academy. Tech, Museum, Advisory.

JOHN L. PORTER
Allegheny. Chairman Union Storage Company. Tech, Art, Finance, Advisory.

JOHN B. SEMPLE
Lehigh. Museum.

GEORGE E. SHAW
Michigan. Reed, Smith, Shaw and McClay. Art, Museum, Advisory.

*WILLIAM WATSON SMITH
Princeton. Smith, Buchanan, Scott and Gordon. Art, Finance, Library.

*WILLIAM J. SOOST
City Council. Auditing, Music Hall.

A. BRYAN WALL
Artist. Art.

WILLIAM P. WITHEROW
Yale. President Spencer Manufacturing Company. Music Hall, Museum, Advisory.

‡Deceased